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 [HOME](#)

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[Mission](#)
[Divisions](#)
[Grants](#)
[Testimony](#)
[Other Links](#)
[ASL Home](#)

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Testimony on Children's Health and the Environment by Richard J. Jackson, M.D., M.P.H.

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Good morning. I am Dr. Richard Jackson, Director of the National Center for Environmental Health (NCEH), one of the Centers within the Centers for Disease Control and Prevention (CDC). I would like to thank the Subcommittee for inviting me here today to discuss children's health and the environment. I would like to especially thank you, Chairman Porter, for your continued interest in promoting the good health of America's children. CDC is very excited about the prospect of developing, as you have recently requested, a national media campaign directed at children and young adults with a broad range of messages to help them make choices that are good for their health.

As a pediatrician who has spent the past 25 years working to improve the health of children, I have seen first hand the risks that our children face from hazards in their environment. I have served as a state health official and as chairman of the American Academy of Pediatrics' Committee on Environmental Health. I was also an author of the 1993 report by the National Academy of Sciences, entitled "Pesticides in the Diets of Infants and Children."

Children's Unique Risks From Environmental Toxicants As we focus on the issue of children's health and the environment, we must remember that it is the child's job to immerse herself in her environment. It is an absolutely normal and essential part of human development that children taste, touch, smell, and come into close contact with the world around them.

This information helps us to understand why children are more vulnerable than adults to environmental toxicants. Children are growing and developing, and their capacity to detoxify chemicals may be less developed than that of adults. Children are also more exposed to environmental hazards than are adults because of certain behaviors, such as spending more time outdoors, crawling, putting objects in their mouths, and consuming more food, water, and air relative to their body weight. Although exposures to some environmental hazards have decreased because of new regulations and standards, children continue to be exposed to many environmental hazards. In the past 50 years in this country we have made great strides in making the environment safer for adults, but unfortunately, we haven't done nearly as good a job of making the world a safe place for children to live, learn, and play.

In my remarks today, I will be addressing two sets of activities related to children's health and the environment. First, I will discuss the work of the President's Task Force on Environmental Health Risks and Safety Risks to Children. Then, I will address specific children's environmental health activities currently taking place at CDC. I will conclude by discussing a future project that would be the next step in protecting children's health from environmental exposures.

President's Task Force on Environmental Health Risks and Safety Risks to Children

It is my privilege to serve as one of the co-chairs of the senior staff working group under the President's Task Force on Environmental Health Risks and Safety Risks to Children. This Task Force was created by Executive Order 13045 on Protection of Children from Environmental Health Risks and Safety Risks, issued in April 1997. The Executive Order charges federal agencies with developing strategies to protect children from environmental threats.

The Task Force has developed a list of four priority areas to be addressed in the areas of children's environmental health and safety. These four priorities are 1) asthma, 2) developmental disorders (including lead poisoning), 3) childhood cancer and 4) injuries. Some of the achievements of the Task Force related to these priorities include:

1. An FY 2000 budget initiative announced by the First Lady and a National Asthma Prevention and Control Plan entitled *Asthma and the Environment: A Strategy to Protect Children*. The plan calls for serious and sustained efforts in the areas of national asthma surveillance, research into the environmental factors that cause or worsen childhood asthma, public health education programs for patients, parents, and health care providers, and research into the disproportionate impact that asthma has on minorities and the poor. In FY 2001, the President's budget requests \$135 million for activities to support the Task Force's asthma activities at the Department of Health and Human Services (DHHS) and the U.S. Environmental Protection Agency (EPA).
2. In partnership with CDC, members of the President's Task Force are embarking on a plan to develop a major, prospective longitudinal study on the impact of environmental factors on children's development. In the area of lead poisoning, on March 29, Mrs. Gore released the Federal strategy to eliminate childhood lead poisoning. The FY 2001 President's budget requests \$164.5 million for the strategy.
3. The National Network for Research on Cancer in Children, a major initiative to support studies on the causes of childhood cancer. This national network would expand upon the Children's Oncology Group, a single nationwide structure involving most of the 200 institutions that treat childhood cancer. In addition to providing an essential infrastructure to support studies on the causes of childhood cancer, it would also enhance surveillance activities by state and regional population-based registries.
4. In the area of unintentional injuries, the agencies involved in the Task Force are working together and with the private sector in a major effort to reduce traumatic brain injuries. Child occupant restraints and bicycle helmets are readily available, off-the-shelf interventions, which, if properly and widely used would lead to a major reduction in traumatic brain injuries. The Department of Transportation (DOT) has developed its excellent Safe Communities Program. The other Cabinet departments involved in the Task Force, particularly DHHS and the Consumer Product Safety Commission (CPSC), along with private sector corporations and organizations, are working with DOT to expand the approach of the Safe Communities Program along with other approaches to include the prevention of traumatic brain injuries through the wide spread use of these interventions.

CDC, along with its sister agency the Agency for Toxic Substances and Disease Registry (ATSDR), has an important role in addressing the Task Force's priority areas,

so that federal agencies can collaborate effectively to protect children's health.

CDC's Role in Children's Environmental Health

CDC's mission is to promote health and quality of life by preventing and controlling disease, injury, and disability. We do this by identifying emerging and reemerging public health problems, determining the scope of these public health problems, conducting research to identify preventable causes of public health problems, and developing and evaluating public health intervention programs. CDC is not only involved in preventing infectious diseases, a significant environmental cause of childhood death and disease, but is also involved in preventing other detrimental exposures. Among our many other activities, we research environmental exposures in order to try to prevent asthma, birth defects, developmental disabilities and other conditions and diseases that are believed to be caused by such exposures. Our responsibility for protecting and improving the health of the U.S. population includes the more important role of identifying and protecting at-risk populations, such as children.

Highlights of CDC's Children's Environmental Health Activities

There are numerous activities at CDC that are focused on safeguarding the health of our children. I want to highlight a few of these, including CDC's asthma program, biomonitoring activities, childhood lead poisoning prevention program, and our birth defects and developmental disabilities program. There are now almost 5 million American children suffering from asthma. Over the past decade, significant research has been conducted on asthma, but little of this research has been translated into public health action. A survey sponsored by the Council for State and Territorial Epidemiologists (CSTE) determined that 80% of the states needed to implement an asthma program. Public health agencies are in a unique position to translate this growing science base into public health action that will reduce the human and financial toll of asthma. Beginning this year, CDC is working to establish a comprehensive national program for asthma prevention and control which includes **surveillance, education and training, and prevention research** efforts at the local, state and national level. In order to improve the management and control of asthma, program activities will rely on broad partnerships involving public health agencies, educators, managed care organizations, and voluntary organizations. With a comprehensive asthma strategy, it is possible that a significant portion of the physical and financial toll of asthma can be eliminated.

In addition to the negative health impacts that environmental triggers of asthma can have on children, exposures to other substances in the environment can also cause significant and sometimes permanent damage to a child's health and well-being. The only way to truly determine the nature and extent of these potential hazards is to determine exactly what substances are found in children and at what levels. The unique capabilities of the biomonitoring program at CDC's Environmental Health Laboratory are essential to this task. Building on existing capabilities, CDC will be able to measure the exact amount of certain chemicals in a child's blood or urine in order to aid in determining whether or not there is a health risk posed to the child from a particular exposure. With this information, public health and medical professionals will be able to much more easily determine which exposures are harmful and which are not.

An example of the utility of the CDC Environmental Health Laboratory in providing critical information about exposure to a known toxic substance is the methyl parathion pesticide exposures that occurred in several states, including Illinois, Mississippi, Texas, and Arkansas, between 1994 and 1996. During this time period thousands of homes in seven states were illegally sprayed with methyl parathion, an agricultural chemical akin to a nerve agent that is only legal for use outdoors by specifically trained agricultural pesticide applicators. CDC's Environmental Health Lab was able to analyze more than 15,000 human specimens collected by ATSDR and determine which people had been dangerously exposed and which people were in no danger. This enabled public health professionals in these communities to rapidly determine who needed to be evacuated and who could safely remain in their homes.

The Environmental Health Lab is applying similar technology in the development of a National Exposure Report Card. This Report Card will contain an assessment of the exposure of the U.S. population, including children, to a variety of toxic substances by measuring these toxicants through the National Health and Nutrition Examination Survey (NHANES). NHANES is a national survey conducted by CDC that represents the entire U.S. civilian, non-institutionalized population.

These toxic substances will include many known or suspected of causing cancer, birth defects, respiratory, neurologic, immunologic, renal and other disease. Although we cannot measure all toxic substances in young children, examples of toxic substances for which data will be available include heavy metals such as lead, cadmium, arsenic, mercury, uranium; pesticides such as DDT, dieldrin, chlordanes; dioxins and furans, PCBs; and volatile organic compounds such as benzene, vinyl chloride, MTBE and methylene chloride. Nationally representative data on children's exposure to certain substances will be available over the course of the next 3 years as the data become statistically meaningful. It will identify how much exposure children have to these toxicants; and how effective interventions are in reducing children's exposure to toxic substances. The first installment of this report card, containing information on an initial set of 25 chemicals, will be released late this year. CDC's goal is to increase the number of chemicals included to 100 over the next few years.

One of the substances that continues to threaten children's health and development is lead. Lead poisoning can cause learning disabilities, behavioral problems, and at very high levels, seizures, coma and even death. According to a CDC nationwide health survey conducted from 1991-94, 890,000 U.S. children age 1-5 have elevated blood lead levels, and children from racial minorities and lower-income families are disproportionately effected. The major sources of lead exposure today are deteriorated paint in older housing, and dust and soil that are contaminated with lead from old paint and from past emissions of leaded gasoline. Using a 3 percent discount rate, the quantifiable economic benefit of eliminating lead-based paint hazards through interim control programs in the nation's pre-1960s housing will exceed \$11.2 billion, with net benefits estimated at \$8.9 billion. A detailed analysis of these costs is available in the Federal lead strategy.

Because data have shown that certain populations of children are at higher risk for lead poisoning, CDC has recently changed the focus of its efforts from universal screening to a much more narrow approach that targets children at higher risk, such as those living in older homes and those on Medicaid. We believe that by targeting our efforts to the populations that have been demonstrated to be at greatest risk, we will be able to eliminate childhood lead poisoning as a major public health problem by the year 2010.

The final ongoing program area that I would like to cover involves the efforts underway at CDC to determine what role the environment may have in causing birth defects and developmental disabilities. One out of thirty babies born in the United States is born with a major birth defect. About 17% of U.S. children under 18 years of age have a developmental disability, and approximately 2% of school-aged children in the U.S. have a serious developmental disability, such as mental retardation or cerebral palsy. Although progress has been made in our understanding of the causes of these devastating occurrences, we still do not know the etiology of most of these conditions that affect the lives of so many families. These causes are likely to be multi factorial, including environmental, infectious, nutritional and genetic factors. In future years we hope to capitalize on advances in laboratory and epidemiological research at CDC to identify many ways that these conditions can be prevented.

One example of a discovery related to the perinatal environment that can improve the chances of a successful birth outcome relates not to the presence of something harmful during pregnancy, but rather to the absence of something beneficial, in this case folic acid. Spina bifida and anencephaly are the two most common types of neural tube birth defects. Each year approximately 3,900 pregnancies are affected by spina bifida or anencephaly. Lifetime costs associated with a typical case of spina bifida-including medical care, special education, therapy services, and loss of earnings-exceed \$500,000 per child. Folic acid, a B vitamin, is essential for proper development of the neural tube. If women consume 400 micrograms (mcg) of folic acid before conception

through at least the first trimester of pregnancy, up to 50% of potential cases of spina bifida and anencephaly could be prevented. CDC is leading a national effort to prevent these conditions through a National Folic Acid Campaign. This campaign includes the following components (1) using birth defects surveillance data to target resources, plan interventions, and evaluate intervention efforts; (2) educating reproductive-age women about how folic acid can prevent spina bifida and anencephaly; (3) building partnerships to implement and evaluate interventions; and (4) conducting research to plan and evaluate intervention efforts. CDC also founded the National Council on Folic Acid, which coordinates this national campaign.

Along with these CDC activities it is important to recognize the children's environmental health work of our sister agency ATSDR, whose mission is to address the health impacts around hazardous waste sites. As a part of this mission, ATSDR has put special emphasis on the health of children in conducting their health studies, surveillance, and other activities. Of particular note among these activities is their ongoing collaboration with the Association of Occupational and Environmental Clinics (AOEC). Along with the AOEC, ATSDR has created a number of Pediatric Environmental Health Specialty Units at AOEC clinics around the country. The purpose of these specialty units is to reduce environmental health threats to children by improving access to expertise in pediatric environmental medicine and strengthening public health prevention capacity.

Next Step: Children's Longitudinal Cohort Study

I would like to conclude my testimony by discussing where we must go from here. In considering the impact that environmental exposures can have on children, it is important to realize what we know now and what we still do not adequately understand. The effects of large dose short term exposures, which are generally considered poisonings, have received significant attention, while the effects of long term low dose exposures are not nearly as well understood. It is in this area that our future work must concentrate.

The only way to begin to better understand the long term effects of children's exposure to chemicals in the environment, when this exposure is either prenatal or occurs in low doses over a long period of time, is through the use of a longitudinal cohort study that follows a group of mothers and their children over a long period of time. An example of such a cohort study is the Framingham longitudinal cohort study, from which a significant amount of what we know about cholesterol and heart disease was discovered. It is this type of longitudinal cohort study, modeled after Framingham, that must be employed to identify preventable environmental, infectious, nutritional, and/or genetic risk factors contributing to adverse outcomes at birth, during childhood or during adulthood. These conditions may be highly prevalent among children in our schools (e.g., attention deficit hyperactivity disorder and asthma) or less common but associated with greater lifelong disability (e.g., cerebral palsy, mental retardation, autism, birth defects). Common adverse reproductive outcomes such as low birth weight could also be studied. By collecting data about these children and their mothers and monitoring exposure from the beginning, many of the causes of these serious and sometimes lifelong conditions may be unraveled.

When a new baby is brought home for the first time, the adults in that child's life shift their perspective about the safety of the home. Suddenly, cabinets need to be locked, stairs need to be blocked, and outlets need to be plugged. These are normal and fully expected changes in outlook that are essential to protecting a child's well-being. For parents these concerns extend from the day the children are brought home until the day they move out and include the safety of the house itself along with all of the things that are brought into the house (e.g., pesticides, second hand smoke, etc.) Unfortunately, we haven't broadened this shift in perspective to include the world outside of the home. As we bring children on to the planet, we as a society need to be mindful of children's safety throughout their multiple environments--from home to school and beyond. By doing this, we will not only be helping our kids, but also making the planet a better place to live for all of us.

Thank you for the opportunity to testify today. I am happy to answer any questions that

you may have.

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